

## SEQUENCE LISTING

	85	90	95	
Gln Arg Phe Leu Arg Asp Asp Gly Thr Val Lys Val Ser Arg Ser Leu				
100	105	110		
Lys Glu Thr Ala Asn Lys Val Arg Arg Ser Lys Asp Glu Leu Tyr Lys				
115	120	125		
Gln Phe Gly Arg Ala Pro Thr Ile Ala Glu Val Ala Glu Ala Val Gly				
130	135	140		
Ile Thr Pro Glu Glu Val Val Phe Ala Gln Glu Ala Ser Arg Ala Pro				
145	150	155	160	
Ser Ser Ile His Glu Thr Val Phe Glu Asn Asp Gly Asp Pro Ile Thr				
165	170	175		
Leu Ile Asp Gln Ile Ala Asp Glu Gly Val Asn Lys Trp Phe Glu Lys				
180	185	190		
Ile Ala Leu Lys Asp Ala Ile Ser Arg Leu Ser Glu Arg Glu Gln Leu				
195	200	205		
Ile Val Tyr Leu Arg Tyr Tyr Lys Asp Gln Thr Gln Ser Glu Val Ala				
210	215	220		
Glu Arg Leu Gly Ile Ser Gln Val Gln Val Ser Arg Leu Glu Lys Arg				
225	230	235	240	
Ile Leu Leu Thr Ile Lys Glu Gln Ile Glu His				
245	250			
<210> 3				
<211> 2265				
<212> DNA				
<213> Brevibacillus choshinensis				
<400> 3				
gtgaacgcag tgaagaaagg caagaagcta ttatccatcc tattttcttc ctcactggtc			60	
ctgagcggca ttgcggcggt tccagcgaca gggatggcca agtcaaagga caa gccgccc			120	
cttgaagtgg atttgtccac agtgaacatg gatcggttgg ttaaaggcctt gatcgaccaa			180	
ggtgaaatcg acgaggacgc cgaccaggaa gagatcaaca aagctgtgga gaagttttg			240	
agagacaaga aagtccccca cggcattgtat gactccagct cttcgggaa aaa gcaagc			300	
aaaacccagc ttccggcagt atcaaaggca gcaagcaaag tatccaagct caaagatgac			360	
aagcaagtgc ggcgttccaa gcgggtacat acggataatc tgggtattgc cctggcgcag			420	
ttcaatgtatc tggagcacaa ccaggtgccaa aaacaaagcg attccgttg gacggcagac			480	
ttcgaccaaa agcactacga gggaaatgctt ttcgatcgta aaggctatac gactcctgaa			540	
gggataagca tgaccacgt gccaagttac tactacgagc aatcggttga gacatggacc			600	
gtggatgggg ttgtcactcc gtgggttactt gcccggaaaataagaaatt ctacgggttga			660	
aacgatgaaa acggcaacga tgccaaacccca cgcgatctgg tcgtcgagac actggaaatct			720	
gtagggatg ccatcaaggg tcatgaagaa gaatacgacc aacgacccc gtagtacttg			780	
gatggagaca gcgatctgtat ggagccggat ggcgtatgttgg acaacctgtat gctgggttac			840	
tccggatttg gtgaagagac tggggaaagat gcggatgcga tctggctca ccgtggact			900	

ctgaaaaagc cgacagaaaat tccaggcacc agcctgaaag cttacgacta catgattcag	960
cctgaagatg ggcgcacccgg cgtattcgca catgaatacg gacacaacct gggactgcca	1020
gatctgtatg acacgacaag actgggacat gattgccgg ttggcgcatt gtcgctgatg	1080
tcttcggaa gccatacagg taagatttc caaacccaaac caaccggatt tgatccgg	1140
tccaaaatga tgctgcagga aatgtatggg ggcaagtggaa ttgagccgca agtcatcaat	1200
tacgaagacc tgaaaaaaacg gaaaaaagcag gcitcgctt acgatggcag cagcctcgat	1260
gaagatggca aagtcatcaa gctgaatatg ccgcaagtag agaagacacc gccgggttcaa	1320
ccgaaagacg gcgattattc ttacttctcc gatgagggcga acaatctgaa cacgaagatg	1380
acttcggaaag tgatcgacct gacaggcgcc agctccgcat cgatgagctt cgactcctgg	1440
agagcgatcg agaccgggta cgactacctg tacgtgaacg tgattgatgt cgactcagg	1500
gagagcacaatc cagtaaaaga gtacgatgac gaaaccaaag gctgggataa ggaagaaatc	
1560	
agcctgaacg atttcgctgg caaaaagatt caagtcgagt tcaactacgt gacggatggc	1620
ggcttggcga tgcggctt ctatctggat aatttgcag tcacagcaga cggcgaagta	1680
gtcttcctgg atgatgcaga aggccgaccag aagtttgatc tggatggatt catccattc	1740
gacggcgaag gcaaaatgtt cgacgcgtac tacctggtag agctgcgcctc ccatgaaggc	1800
gtggacgagg gtctgaaata cttccgcgc aatgacacat tcttcacgta tgatccaggt	1860
ctgggtatct ggtactacga tggacgctt ggcaaaacgc aagacaacaa caccagcaac	1920
catccaggct acggcatgct gggcgtagtc gatgcgcattc aggaagttcg ttactggaaat	1980
aacgatgagg gcaacgagga ggcattgcc gactccgtt accaagtgaa cgatgcggca	2040
ttcagccga acaaaacctc cggcatggat ctgcactaca ttctcgacat gatggattac	2100
gagccgctga aaggcattac cgtattcaaa gacagtgtatg attacacgat gccggaagtt	2160
ccggaaatcg gaaaaatctt gccaagatc ggtctgcaaa tcaaattaaat tcgtgtgtcc	2220
aagaaattca cgaacgcaca ggtcgagttc tccatcaaaa aataaa	2265
<210> 4	
<211> 754	
<212> PRT	
<213> <i>Brevibacillus choshinensis</i>	
<400> 4	
Val Asn Ala Val Lys Lys Gly Lys Lys Leu Leu Ser Ile Leu Phe Ser	
5 10 15	
Ser Ser Leu Val Leu Ser Gly Ile Ala Ala Val Pro Ala Thr Gly Met	
20 25 30	
Ala Lys Ser Lys Asp Lys Pro Pro Leu Glu Val Asp Leu Ser Thr Val	
35 40 45	
Asn Met Asp Arg Leu Val Lys Ala Leu Ile Asp Gln Gly Glu Ile Asp	
50 55 60	
Glu Asp Ala Asp Gln Glu Glu Ile Asn Lys Ala Val Glu Lys Phe Leu	
65 70 75 80	
Arg Asp Lys Lys Val Pro His Gly Ile Asp Asp Ser Ser Ser Phe Gly	
85 90 95	

Lys Lys Ala Ser Lys Thr Gln Leu Ser Ala Val Ser Lys Ala Ala Ser  
 100 105 110  
 Lys Val Ser Lys Leu Lys Asp Asp Lys Gln Val Arg Ala Ser Lys Arg  
 115 120 125  
 Val His Thr Asp Asn Leu Val Ile Ala Leu Val Glu Phe Asn Asp Leu  
 130 135 140  
 Glu His Asn Gln Val Pro Lys Gln Ser Asp Ser Leu Trp Thr Ala Asp  
 145 150 155 160  
 Phe Asp Gln Lys His Tyr Glu Glu Met Leu Phe Asp Arg Lys Gly Tyr  
 165 170 175  
 Thr Thr Pro Glu Gly Ile Ser Met Thr Thr Met Ala Lys Tyr Tyr Tyr  
 180 185 190  
 Glu Gln Ser Gly Glu Thr Trp Thr Val Asp Gly Val Val Thr Pro Trp  
 195 200 205  
 Leu Thr Ala Glu Lys Asp Lys Lys Phe Tyr Gly Gly Asn Asp Glu Asn  
 210 215 220  
 Gly Asn Asp Ala Asn Pro Arg Asp Leu Val Val Glu Thr Leu Glu Ser  
 225 230 235 240  
 Val Gly Asp Ala Ile Lys Gly His Glu Glu Glu Tyr Asp Gln Arg Asp  
 245 250 255  
 Pro Tyr Asp Leu Asp Gly Asp Ser Asp Leu Met Glu Pro Asp Gly Met  
 260 265 270  
 Leu Asp Asn Leu Met Leu Val His Ser Gly Ile Gly Glu Glu Thr Gly  
 275 280 285  
 Glu Asp Ala Asp Ala Ile Trp Ser His Arg Trp Thr Leu Lys Lys Pro  
 290 295 300  
 Thr Glu Ile Pro Gly Thr Ser Leu Lys Ala Tyr Asp Tyr Met Ile Gln  
 305 310 315 320  
 Pro Glu Asp Gly Ala Pro Gly Val Phe Ala His Glu Tyr Gly His Asn  
 325 330 335  
 Leu Gly Leu Pro Asp Leu Tyr Asp Thr Thr Arg Leu Gly His Asp Ser  
 340 345 350  
 Pro Val Gly Ala Trp Ser Leu Met Ser Ser Gly Ser His Thr Gly Lys  
 355 360 365  
 Ile Phe Gln Thr Gln Pro Thr Gly Phe Asp Pro Trp Ser Lys Met Met  
 370 375 380  
 Leu Gln Glu Met Tyr Gly Gly Lys Trp Ile Glu Pro Gln Val Ile Asn  
 385 390 395 400  
 Tyr Glu Asp Leu Lys Lys Arg Lys Lys Gln Ala Ser Leu Tyr Asp Gly  
 405 410 415  
 Ser Ser Leu Asp Glu Asp Gly Lys Val Ile Lys Leu Asn Met Pro Gln

420	425	430
Val Glu Lys Thr Pro Pro Val Gln Pro Lys Asp Gly Asp Tyr Ser Tyr		
435	440	445
Phe Ser Asp Glu Gly Asp Asn Leu Asn Thr Lys Met Thr Ser Glu Val		
450	455	460
Ile Asp Leu Thr Gly Ala Ser Ser Ala Ser Met Ser Phe Asp Ser Trp		
465	470	475
Arg Ala Ile Glu Thr Gly Tyr Asp Tyr Leu Tyr Val Asn Val Ile Asp		
485	490	495
Val Asp Ser Gly Glu Ser Thr Thr Val Lys Glu Tyr Asp Asp Glu Thr		
500	505	510
Lys Gly Trp Asp Lys Glu Glu Ile Ser Leu Asn Asp Phe Ala Gly Lys		
515	520	525
Lys Ile Gln Val Glu Phe Asn Tyr Val Thr Asp Gly Gly Leu Ala Met		
530	535	540
Ser Gly Phe Tyr Leu Asp Asn Phe Ala Val Thr Ala Asp Gly Glu Val		
545	550	555
Val Phe Ser Asp Asp Ala Glu Gly Asp Gln Lys Phe Asp Leu Asp Gly		
565	570	575
Phe Ile His Phe Asp Gly Glu Gly Lys Met Tyr Asp Ala Tyr Tyr Leu		
580	585	590
Val Glu Leu Arg Ser His Glu Gly Val Asp Glu Gly Leu Lys Tyr Phe		
595	600	605
Arg Arg Asn Asp Thr Phe Phe Thr Tyr Asp Pro Gly Leu Val Ile Trp		
610	615	620
Tyr Tyr Asp Gly Arg Phe Gly Lys Thr Gln Asp Asn Asn Thr Ser Asn		
625	630	635
His Pro Gly Tyr Gly Met Leu Gly Val Val Asp Ala His Gln Glu Val		
645	650	655
Arg Tyr Trp Asn Asn Asp Glu Gly Asn Glu Glu Ala Ile Ala Asp Ser		
660	665	670
Arg Tyr Gln Val Asn Asp Ala Ala Phe Ser Pro Asn Lys Thr Ser Gly		
675	680	685
Met Asp Leu Asp Tyr Ile Leu Gly Thr Met Asp Tyr Glu Pro Leu Lys		
690	695	700
Gly Ile Thr Val Phe Lys Asp Ser Asp Asp Tyr Thr Met Pro Glu Val		
705	710	715
Pro Glu Ile Gly Lys Ile Leu Pro Lys Ile Gly Leu Gln Ile Lys Leu		
725	730	735
Ile Arg Val Ser Lys Lys Phe Thr Asn Ala Gln Val Glu Phe Ser Ile		
740	745	750

Lys Lys

754

<210> 5  
<211> 1362  
<212> DNA  
<213> Brevibacillus choshinensis  
<400> 5  
atgaaccatc ctgatttcg cgatctaccc gcctgcatgg aagacgtaac cctcgctgcc 60  
ctggacgagt acactggtcc accagatccg accgaataacc aatcattgtatcc tggacgcttg 120  
caagaggttg ccgaaaactct ccctccgctc tatcgggagc atgtgtatca ccctttctt 180  
caagcgatgg acaagttgtc tgagtcagga tttgcgcaga tgctccgtcg agatcctcaa 240  
aaagagcgag aagccggctt gtttgcgtatcc acgcacagg ccattctgca aaacggcgaa 300  
gcgttatgaac gcgtatggccac ggatgcctt caggaagtag tcagcgattt gtacgacggt 360  
tttttaagcg aggaagacag gagtggcattt aaaccgcctt atgaaagctt gattgctctt 420  
ctggtcaaataat ggggacgccc gcaattcggg ctttatacgatggacagctga agccgctgcc 480  
cattttggca tcaagacggg cattgtcaat ttgcggccgg caaacggccg cctgggtctg 540  
ctgcgttgtt ctgcatttgcgtt tcacgaaacg gtcgcacacg acattctcca cgccgacacc 600  
ggtttgcctt gagaactgca gcaaaaccgtc tatgacgctt tgtttgcgtt gcttcacaat 660  
cggacgctgg cggactactg gtcgccttgcgtt atcgacgaga ctgcctccga cgtttggga 720  
atccctgaaca cggcccccgc tgcagggtt ggactgattt gatattccg cggcccttaat 780  
aaggcgtaaca cggacaaggc aacactgcgg aatacaggc cacagaatga cccacatcca 840  
gcagacatct tgcgcgttta tcttgctgtt gagactgctc gtctgctgca ttttgacaac 900  
gcacccgact gggcacaggc acttctcgag gaaaccaggc gtgtatctttaa aggcatcaca 960  
ataggcagag cctcttttggaa tgcagaaacc gctcaaaaat ctgctgcctt tgctgcgtcg 1020  
acaattatgg aagcacgcct gctcgtctg gaaggcgtatg ccctcgggca aattcaaaaac 1080  
tggcacaacg aggatgaacg aatcggttgcgtt gaaattcgctt cccattttac aggttccctg 1140  
accgtgcaag acggcatttgcgtt ttcgggtatg tatgctgcgc atgtcggttgcgtt agcagccgtc 1200  
caagcagccg tttcaggaga gatggatacc tccgctgcct tcaacaggat gaaaaccttg 1260  
ctgaagagca tgcacgacgc caatcccttcc tggggacctc tctatgtacg atatcggtt 1320  
gatctcactc cgcatcgcat ttactccgt tctgcgtt gatcttgcgtt ag 1362

<210> 6

<211> 453

<212> PRT

<213> Brevibacillus choshinensis

<400> 6

Met Asn His Pro Asp Phe Arg Asp Leu Pro Ala Cys Met Glu Asp Val

5

10

15

Thr Leu Ala Ala Leu Asp Glu Tyr Thr Gly Pro Pro Asp Pro Thr Glu

20

25

30

Tyr Gln Ser Leu Tyr Gly Arg Leu Gln Glu Val Ala Glu Thr Leu Pro

35

40

45

Pro Leu Tyr Arg Glu His Val Tyr His Pro Phe Leu Gln Ala Met Asp  
       50                     55                     60  
 Lys Leu Ser Glu Ser Gly Phe Ala Gln Met Leu Arg Arg Asp Pro Gln  
       65                     70                     75                     80  
 Lys Glu Arg Glu Ala Gly Leu Phe Cys Asp Ile Ala Gln Ala Ile Leu  
       85                     90                     95  
 Gln Asn Gly Glu Ala Tyr Glu Arg Asp Ala Thr Asp Ala Phe Gln Glu  
       100                    105                    110  
 Val Val Ser Asp Leu Tyr Asp Gly Phe Leu Ser Glu Glu Asp Arg Ser  
       115                    120                    125  
 Gly Ile Lys Pro Pro Asp Glu Ser Leu Ile Ala Pro Leu Val Lys Trp  
       130                    135                    140  
 Gly Arg Pro Gln Phe Gly Pro Tyr Thr Trp Thr Ala Glu Ala Ala Ala  
       145                    150                    155                    160  
 His Phe Gly Ile Lys Thr Gly Ile Val Asn Leu Pro Pro Ala Asn Ala  
       165                    170                    175  
 Arg Leu Gly Leu Leu Ala Trp Ser Ala Leu Gly His Glu Thr Ala Gly  
       180                    185                    190  
 His Asp Ile Leu His Ala Asp Thr Gly Leu Leu Gly Glu Leu Gln Gln  
       195                    200                    205  
 Thr Val Tyr Asp Ala Leu Phe Asp Glu Leu His Asn Arg Thr Leu Ala  
       210                    215                    220  
 Asp Tyr Trp Ser Leu Arg Ile Asp Glu Thr Ala Ser Asp Val Leu Gly  
       225                    230                    235                    240  
 Ile Leu Asn Thr Gly Pro Ala Ala Gly Ile Gly Leu Ile Gly Tyr Phe  
       245                    250                    255  
 Arg Gly Leu Asn Lys Ala Tyr Thr Gly Gln Ala Thr Leu Arg Asn Thr  
       260                    265                    270  
 Gly Pro Gln Asn Asp Pro His Pro Ala Asp Ile Leu Arg Gly Tyr Leu  
       275                    280                    285  
 Ala Ala Glu Thr Ala Arg Leu Leu His Phe Asp Asn Ala Ser Asp Trp  
       290                    295                    300  
 Ala Gln Ala Leu Leu Glu Glu Thr Arg Arg Asp Leu Lys Gly Ile Thr  
       305                    310                    315                    320  
 Ile Gly Arg Ala Ser Leu Asp Ala Glu Thr Ala Gln Lys Ser Ala Ala  
       325                    330                    335  
 Ile Val Ala Arg Thr Ile Met Glu Ala Arg Leu Leu Ser Leu Glu Gly  
       340                    345                    350  
 His Ala Leu Gly Gln Ile Gln Asn Trp His Asn Glu Asp Glu Arg Ile  
       355                    360                    365  
 Val Gln Glu Ile Arg Ser His Phe Thr Gly Ser Leu Thr Val Gln Asp

370	375	380		
Gly Ile Val Ser Gly Met Tyr Ala Ala His Val Val Ala Ala Ala Val				
385	390	395	400	
Gln Ala Ala Val Ser Gly Glu Met Asp Thr Ser Ala Ala Phe Thr Gly				
405	410	415		
Met Lys Thr Leu Leu Lys Ser Met His Asp Ala Asn Pro Ser Trp Gly				
420	425	430		
Pro Leu Tyr Val Arg Tyr Arg Gly Asp Leu Thr Pro His Arg Ile Tyr				
435	440	445		
Ser Arg Ser Ala Ser				
450	452			
<210> 7				
<211> 28				
<212> DNA				
<213> Artificial Sequence				
<400> 7				
gggggtacct cactctgtca gcatgctg				
				28
<210> 8				
<211> 27				
<212> DNA				
<213> Artificial Sequence				
<400> 8				
gggggatccc ggcgtgattc ccactgc				
				27
<210> 9				
<211> 27				
<212> DNA				
<213> Artificial Sequence				
<400> 9				
gggctgcaga tagcggatga aggtgtg				
				27
<210> 10				
<211> 30				
<212> DNA				
<213> Artificial Sequence				
<400> 10				
gggtctagac ctgcttatac atctgtttcg				
				30
<210> 11				
<211> 39				
<212> DNA				
<213> Artificial Sequence				
<400> 11				
gagagaccat ggaccatcct gatttcgcg atctacccg				
				39

<210>	12	
<211>	60	
<212>	DNA	
<213>	Artificial Sequence	
<400>	12	
	agaattcagt ggtgggtggt gttgggtgg tggctcgac aacgggatgt aatgcgtgc	60
<210>	13	
<211>	44	
<212>	DNA	
<213>	Artificial Sequence	
<400>	13	
	aaaagaattc ttctgcaga acaggatgcg ggggagccgc cgct	44
<210>	14	
<211>	37	
<212>	DNA	
<213>	Artificial Sequence	
<400>	14	
	aaaaaggatc cttatagcat ctaatcttca acaaact	37
<210>	15	
<211>	39	
<212>	DNA	
<213>	Artificial Sequence	
<400>	15	
	aaaaaaaagat cttgaacgt gacctctaat aattgttaa	39
<210>	16	
<211>	43	
<212>	DNA	
<213>	Artificial Sequence	
<400>	16	
	aaaagaattc aaatcttagaa agtgtgtgct ctgcgaggct gtc	43
<210>	17	
<211>	30	
<212>	DNA	
<213>	Artificial Sequence	
<400>	17	
	tccatggcac aatttggat attatgtaaa	30
<210>	18	
<211>	32	
<212>	DNA	
<213>	Artificial Sequence	
<400>	18	

actcgagtta tatcgctca tttatgtagg at	32
<210> 19	
<211> 37	
<212> DNA	
<213> Artificial Sequence	
<400> 19	
tttttctag actttatgaa tataaagtat agtgtgt	37
<210> 20	
<211> 37	
<212> DNA	
<213> Artificial Sequence	
<400> 20	
gggggctgca gtttatatgcg tctattttag taggatg	37
<210> 21	
<211> 23	
<212> DNA	
<213> Artificial Sequence	
<400> 21	
aarcgngtnc ayacngayaa yct	23
<210> 22	
<211> 23	
<212> DNA	
<213> Artificial Sequence	
<400> 22	
aanccngtng gytgngtytg gaa	23
<210> 23	
<211> 23	
<212> DNA	
<213> Artificial Sequence	
<400> 23	
cctcgtagtg cttttggtcg aag	23
<210> 24	
<211> 23	
<212> DNA	
<213> Artificial Sequence	
<400> 24	
accaataccg gagtgaacca gca	23
<210> 25	
<211> 19	
<212> DNA	
<213> Artificial Sequence	

<400> 25	
actataggc acgcgtgg	19
<210> 26	
<211> 41	
<212> DNA	
<213> Artificial Sequence	
<400> 26	
ctccatggc ttgcgtacc cccgtgcagt ccgtggactg c	41
<210> 27	
<211> 34	
<212> DNA	
<213> Artificial Sequence	
<400> 27	
atataagctt ttagggagag aggacttcca tggt	34
<210> 28	
<211> 35	
<212> DNA	
<213> Artificial Sequence	
<400> 28	
tttctgcagg taaaatcgaa gaaggtaaac tggta	35
<210> 29	
<211> 34	
<212> DNA	
<213> Artificial Sequence	
<400> 29	
aaaaagctt tacttggtga tacgagtctg cgcg	34
<210> 30	
<211> 37	
<212> DNA	
<213> Artificial Sequence	
<400> 30	
tttggatcc gaggagggtgt cggagaactg tagccac	37
<210> 31	
<211> 34	
<212> DNA	
<213> Artificial Sequence	
<400> 31	
aaaaagcttc tacactggca gctcctcctg tctg	34
<210> 32	
<211> 23	
<212> DNA	

<213>	Artificial Sequence			
<400>	32			
aaggatcccc	gtcatatatcg	gca	23	
<210>	33			
<211>	28			
<212>	DNA			
<213>	Artificial Sequence			
<400>	33			
aaaagcttta	ggcggttatcc	gcttttagc	28	
<210>	34			
<211>	39			
<212>	DNA			
<213>	Artificial Sequence			
<400>	34			
tatatccatg	gcttcttact	gccaggcgcc	cttttttaa	39
<210>	35			
<211>	37			
<212>	DNA			
<213>	Artificial Sequence			
<400>	35			
atataagctt	ttatttttagt	gctctctggc	cttggaa	37
<210>	36			
<211>	32			
<212>	DNA			
<213>	Artificial Sequence			
<400>	36			
atattcatga	gcaacgactt	gcttcgatcc	ca	32
<210>	37			
<211>	36			
<212>	DNA			
<213>	Artificial Sequence			
<400>	37			
atataagctt	tcagttctgg	agataatctg	taagta	36